



# Energy and Climate Policy

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Chairman  
Council on Environmental Quality

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# U.S. National Initiatives Since 2001

*\$35 Billion Federal Climate Budget*

*Bi-Partisan Support; More Than Any Other Country*

## **Partnerships**

- Nuclear Power 2010
- Improved NRC Process for Nuclear Power
- Climate Vision (15 Industry Sectors)
- Climate Leaders (100+ Company Leaders)
- Smartway Transportation Partnerships
- Energy Star and Natural Gas Star
- Federal Energy Management Programs

## **Mandates**

- Federal Fuel Economy (“CAFE”)
  - 15% Increase in Light Trucks Through 2011
- Federal Renewable Fuels (“RFS”)
  - 7.5 Billion Gallons By 2012
- Federal Appliance Efficiency
  - 40 Standards (15 From EAct 2005)
- State Renewable Power (“RPS”)
  - 24 States; 80% of Generation
  - Going from 5.6GW, now 14.6GW, to 32GW
- Building Codes- Federal Facilities & States
  - DOE Model Code 30% Improvement

## **Incentives**

- About \$10 billion – EAct 2005
- Clean Coal Investment Tax Credit (\$1.6B + leveraging over \$10B Private capital)
- Loan Guarantees (power and fuels)
- Up to \$3400 Tax Credit for Efficient Vehicles
- Up to \$4000 in Home Solar Incentives
- Biological Sequestration part of \$40+ Billion 2002 Farm Bill Conservation Programs

## **Technology**

- Renewable Power: Advanced Solar and Wind
- Nuclear Power: Generation IV and Fusion
- Coal: Low Carbon Research; Future Gen Zero Emissions Coal & Hydrogen Power Plant; Regional Carbon Capture & Storage Program
- Fuels: Cellulosic Ethanol, Bio-Diesel, Hydrogen
- Vehicles: Plug-in Hybrids, Hydrogen Fuel Cell
- Zero Energy Home Research

# Major New Initiatives This Year

## State of Union “Twenty in Ten”

### • **Alternative Fuels Mandate**

- Replace 15% projected annual gasoline use in 2017 with renewable and alternative fuels
- Mandate use of 35B gallons of alternatives
- Nearly 5 times 2012 target in current law

### • **Vehicle Fuel Economy Mandate**

- Displace 5% of projected annual gasoline use in 2017 with new mandatory rules
- Produce up to 8.5 billion gallons in fuel savings over the next 10 years
- New car standards; extend light truck rules
- Specific targets should be set by experts at the National Highway and Traffic Safety Administration based on feasibility, safety, and benefit/cost assessment

## Executive Order

### **Strengthening Federal Government Environmental, Energy and Transportation Management**

- Reduce Oil Consumption in Vehicles – 2%/year
- Increase Use of Renewable Fuels - 10%/year
- Use More Renewable Power

## Farm Bill Conservation

- Portion of \$50+B for Biological Sequestration
- \$1.6B in New Funding for Energy Innovation
- \$2B in Loans for Advanced Biofuel Plants

## 2008 Budget

- \$2.7 B for the Advanced Energy Initiative
- Hydrogen Fuel
- Advanced Batteries for Plug-In Hybrid Vehicles
- Bio-Diesel
- New Ethanol Production Methods

# U.S. International Initiatives Since 2001

*More Cooperative, Faster, Real Results*

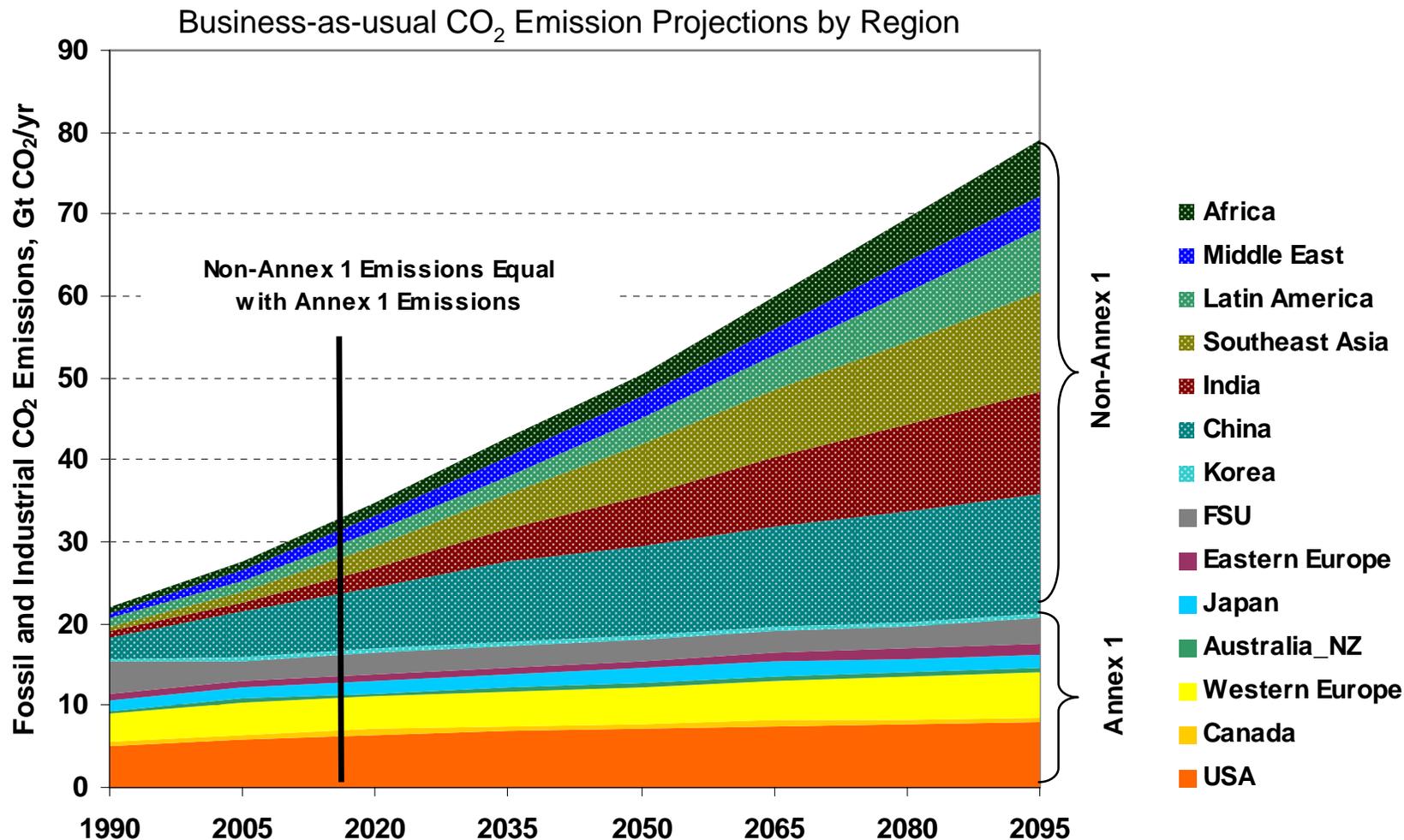
## Global Action Programs

- Asia-Pacific Partnership (7 Nations)
  - Accounts for 50% of emissions
  - Nearly 100 actions
- G-8 Dialogue (13-20 Nations)
  - More than 40 programs
- Methane to Markets (18 Nations)
  - 180+ million tons reduced by 2015
- Renewable Energy and Efficiency (17 Nations)
- 12+ Bilateral Agreements on Technology and Lower Emissions
- Tropical Forest Conservation
- Stopping Illegal Logging

## Technology Advancement

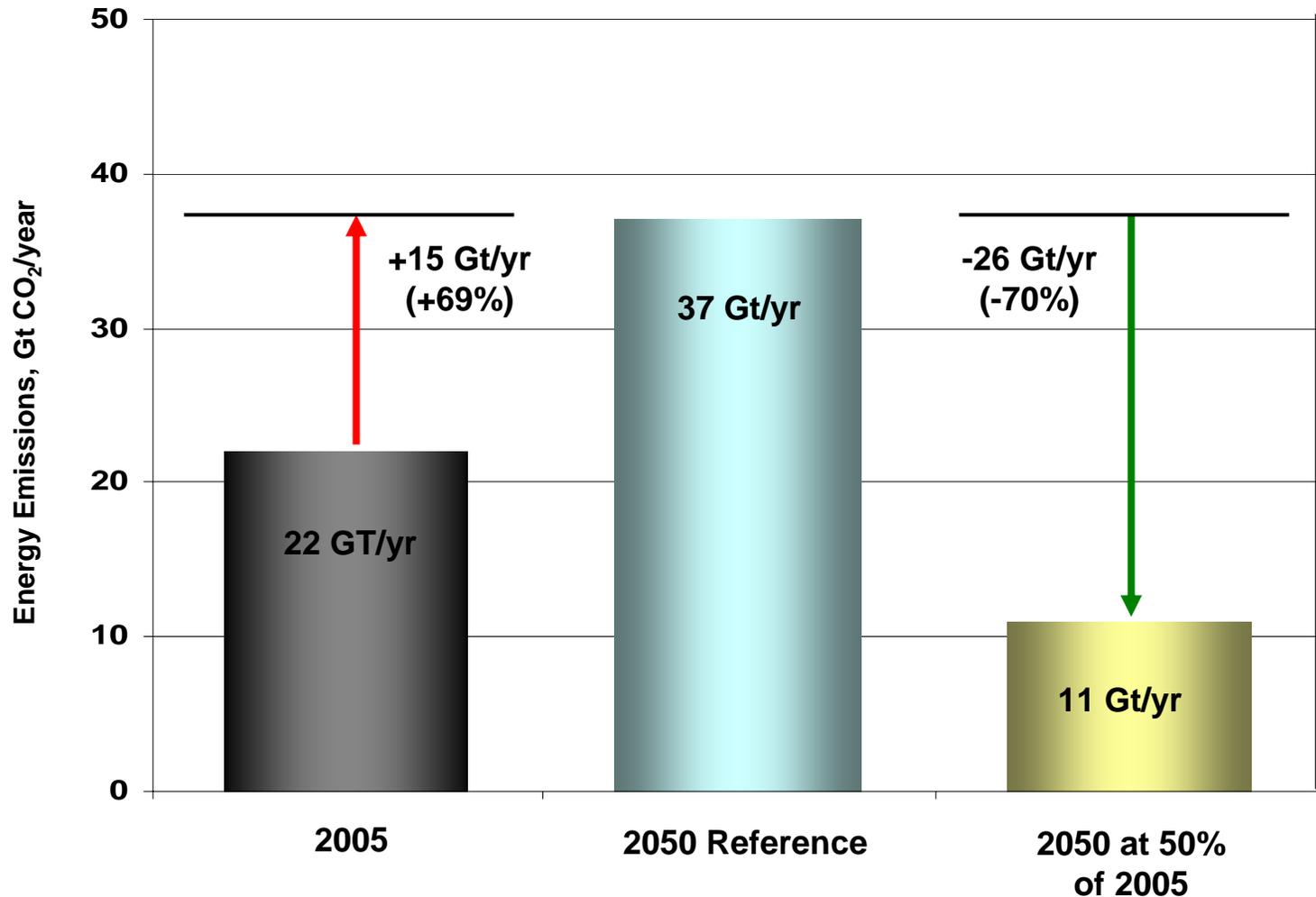
- Carbon Capture and Storage (22 Nations)
- Future Gen Coal (5+ Nations)
- Hydrogen (17 Nations)
- Global Nuclear Energy Partnership (16 Nations)
- Gen IV Nuclear (10 Nations)
- Fusion Energy (7 Nations)
- Global Earth Observation (64 Nations)
  - Recommended by National Academy of Sciences

# Important Transitions in Emitting Countries Over the Coming Century



Data derived from *Global Energy Technology Strategy, Addressing Climate Change: Phase 2 Findings from an International Public-Private Sponsored Research Program*, Battelle Memorial Institute, 2007.

# Major Economies Energy CO<sub>2</sub> Emissions: 2005, 2050 Reference Case, and 2050 at 50% of 2005



Illustrative scenarios based on the CCSP MiniCAM reference scenario. Categories may not match exactly with other aggregations. For example, Europe includes here the following countries from EIA accounting: Belgium, France, Germany, Italy, Netherlands, Poland, Romania, Spain, United Kingdom, and Other Europe. MiniCAM does not include several countries as individual regions: Russia, South Africa, Australia, Mexico, Brazil, and Mexico. Growth rates for the appropriate aggregate regions were used as proxies for growth rates in these individual countries. This is one illustrative scenario: other scenarios would have different emissions growth rates over the century. Results should be taken as illustrative of potential trends rather than as a best guess projection of the future.

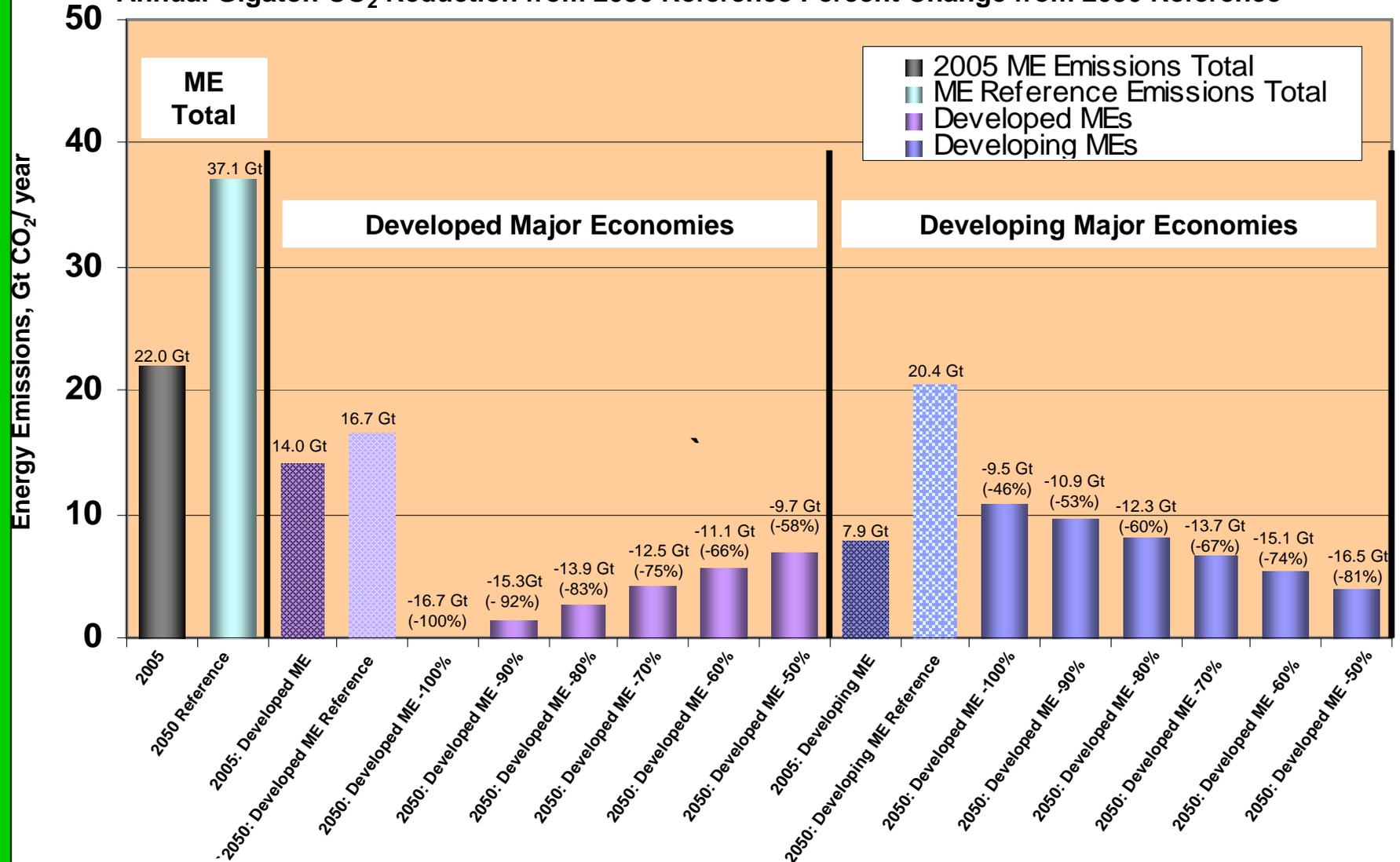
# How Big is One Gigaton of CO<sub>2</sub>?

Technology	Actions that Provide One Gigaton CO <sub>2</sub> / Year of Mitigation or Offsets
Coal-Fired Power Plants	Build 273 “zero-emission” 500 MW coal-fired power plants* <i>Equivalent to about 7% of current global installed coal-fired generating capacity of 2 million MW</i>
Geologic Sequestration	Install 1,000 sequestration sites like Norway’s Sleipner project (1 MtCO <sub>2</sub> /year) <i>Only 3 sequestration projects of this scale exist today</i>
Nuclear	Build 136 new nuclear power plants of 1 GW each instead of new coal-fired power plants without CCS <i>Equivalent to about one third of existing worldwide nuclear capacity of 375 GW</i>
Efficiency	Deploy 273 million new cars at 40 miles per gallon (mpg) instead of 20 mpg - or at 14 km/L instead of 7 km/L
Wind Energy	Install capacity to produce 14 times current global wind generation of 74 GW* <i>Equivalent to more than 1 million, 1 MW wind turbines</i>
Solar Photovoltaics	Install capacity to produce 273 times the current global solar PV generation*
Biomass Fuels from Plantations	Convert a barren area about 2 times the size of the UK (for a total of over 480,000 km <sup>2</sup> )
CO <sub>2</sub> Storage in New Forest	Convert a barren area greater than the size of Germany and France together (for a total of over 900,000 km <sup>2</sup> )

Gigatons = 10<sup>9</sup> Metric tons (1000 Kilograms)

\* Instead of coal-fired power plants without CCS

**Comparative 2050 Energy CO<sub>2</sub> Emissions and Emissions Reductions Needed for Developed and Developing Major Economies to Achieve in 2050 a Combined 50% Reduction in Emissions Below 2005 Under Different Reduction Goals (-100% to -50%) for Developed ME:**  
**Annual Gigaton CO<sub>2</sub> Reduction from 2050 Reference Percent Change from 2050 Reference\***



\*Equals percent reduction from the 2050 reference case for that ME group (i.e., developed or developing). Developed MEs include: U.S., Europe, Russia, Japan, Canada, Korea, and Australia. Developing MEs include: China, India, South Africa, Mexico, Brazil, and Indonesia.